



A brief introduction to new discoveries and research in Chinese archaeology in 2015

Zhongwei Jing¹

Received: 22 September 2016 / Accepted: 30 October 2016 / Published online: 23 August 2018
© The Author(s) 2018

Abstract

This article introduces archaeological excavations, discoveries, and research in China from 2015. The author reviews some major papers published in 2015, in the chronological order of their subject time period, using the periodization commonly used in Chinese archaeology: Paleolithic; Neolithic; Xia, Shang, Western and Eastern Zhou Dynasties; Qin and Han Dynasties; the Three Kingdoms period to Qing Dynasty.

Keywords Chinese archaeology · New discoveries and research in 2015 · Brief introduction

The annual selection of China's *Top 10 Archaeological Discoveries* has always attracted a great deal of attention from both archaeological circles and the public, and the public's interest in archaeology has been gradually increasing over the years. On May 16, 2016, the *Chinese Cultural Relics Newspaper* and the Chinese Society of Archaeology held a joint press conference announcing the top ten major discoveries for the year 2015. These had been chosen from more than 700 archaeological excavation programs after many rounds of selection. The selected sites' time periods range from the Early Paleolithic through the Qing Dynasty and they are found widely distributed across 10 provinces, including in the Central Plains and frontier areas. These top ten discoveries cover a rich variety of sites, including not only prehistoric settlement, cemetery, and city sites, but also types of sites that have rarely been discovered in the past, including mining and metallurgy sites, a water conservancy system, and shipwreck remains. These discoveries offer new information and perspectives to solve some of the major academic issues in Chinese archaeology, and they fully display the achievements and significant breakthroughs from fieldwork in 2015 (Guo Xiaorong 2015).

Since over 1000 excavation reports and research articles were published in 2015, the present paper can only introduce

some of them. Here, we present information related to archaeological remains and new research according to the standard periodization used in Chinese archaeology, namely Paleolithic Age, Neolithic Age, Xia 夏, Shang 商, Western Zhou 西周 and Eastern Zhou 东周 Dynasties, Qin 秦 and Han 汉 Dynasties, and the Three-Kingdoms 三国 to Qing 清 Dynasty period.

1 Paleolithic age

In 2015, archaeologists discovered Paleolithic remains and presented research papers on both southern and northern China.

The Gantangqing 甘棠箐 site is about 1.5 km to the southwest of Longtan 龙潭 Village of Luju 路居 Town in Jiangchuan 江川 County, Yunnan 云南 Province. From October 2014 to February 2015, the Yunnan Provincial Institute of Cultural Relics and Archaeology carried out the excavation of the site. In the revealed area of 50 sq. m they discovered remains of fire usage, 25,153 stone artifacts, 28 bone artifacts, and more than 10 wood artifacts. Moreover, rich faunal and floral remains were unearthed. The geological age of the site could belong to the early Pleistocene, but the absolute age determination is still being carried out. Like the Yuanmou 元谋 site, the Gantangqing site is another very important Early Paleolithic site in Yunnan Province, as it provides new evidence for the theory of the local origin of ancient human beings in East Asia, and it demonstrates again that the central Yunnan Plateau is a key region for human origins (Liu Jianhui 2015).

✉ Zhongwei Jing
jingzw@jlu.edu.cn

¹ The Research Center for Chinese Frontier Archaeology of Jilin University, 2699 Qianjin Ave, Changchun 130012, China

Paleolithic archaeologists in China have also been looking at lithic technologies found outside of the country. Chen Youcheng and Qu Tongli (2015) point out that Levallois technology is a milestone in the prehistoric period, and its development can be divided into four phases: 1. the incipient phase, from 500 to 250 ka BP, characterized by the production of “preferential” Levallois flakes and large Levallois flakes; 2. the developing phase, from 250 to 130 ka BP, when the recurrent method was used and Levallois points of generally more than 10 cm in length were the typical artifact; and 3. the flourishing phase (ca. 130–50 ka BP), when the Mousterian Industry, including Levallois flakes, Levallois points, Levallois blades, as well as side scrapers, notches, denticulates, etc., developed, flake sizes were reduced, and the toolkit appears diversified. During the fourth and last phase, from 50 to 30 ka BP, identified as the declining phase of Levallois technology, Levallois and other technologies, including blade and simple core-flake industries, co-exist in some sites, and the Levallois technology did not play a major role. The changes in Levallois technology and its products may indicate changes in the functions of the stone tools and in human behavior (Chen Youcheng and Qu Tongli 2015).

Liu Yang, Hou Yamei, and Yang Zemeng (2015) study the core flaking technique of the Wulanmulun 乌兰木伦 site in Ordos 鄂尔多斯 City, Inner Mongolia. The site is believed to date to the Late Pleistocene period. Their results show that the core flaking technique in this site can be divided into two stages: primary core reduction and continued core reduction, and they identify at least 17 flaking sequences. The different flaking sequences exhibit choices made concerning the original shapes of the stone core blanks and the raw material. The diversity of the utilization of the original stone blanks and the methods, techniques, and sequences of the flaking reflect how the inhabitants of this site had not only superb knapping skills but also rather strong planning and organizational abilities. Some special sequences (such as the one containing the C3.2.2 method) reflect the intentional production of flakes with special technical features by the hominin inhabitants of the site (Liu Yang, Hou Yamei and Yang Zemeng 2015).

2 Neolithic age

In 2015, archaeologists discovered important new Neolithic sites in both southern and northern China, while some scholars discussed issues concerning cultural chronology, sequences, and communication and put forward some new views.

The Jiangzhuang 蒋庄 site is located at the border of Xinghua 兴化 and Dongtai 东台 counties in Jiangsu 江苏 Province. With the Taidong 泰东 River as the boundary, the site is divided into eastern and western areas. In the eastern area, the main deposits, covering an area of 45 ha, are dated to the Tang 唐 and Song 宋 dynasties. In the western area, the

main deposits extend over 2 ha and belong to the Neolithic Liangzhu 良渚 Culture. From October 2011 to December 2015, the Archaeological Institute of the Nanjing Museum carried out a number of archaeological excavations, mainly in the western area, with a total area of 3500 sq. m, revealing a settlement of the Liangzhu Culture thought to date ca. 5300–4500 BP. 280 tombs, 8 house foundations, more than 110 ash pits, wells, ditches, and some other important features were unearthed, from which nearly 1200 artifacts of different materials, including jade, stone, pottery, and bone, were recovered. It is the first time archaeologists discovered a large scale settlement with elite tombs containing jade *cong* 琮 tubes, *bi* 璧 disks, and other jade objects of the Liangzhu Culture to the north of the Yangtze River. Moreover, the discoveries have disproved the previous academic view about the distribution of the Liangzhu Culture as being limited to south of the Yangtze River. This site is far from the Liangzhu core area, and the many forms of pottery *ding* 鼎 tripods found show distinctive characteristics that are the product of the integration of the Liangzhu and the local culture. Jiangzhuang has particular significance for constructing the prehistoric archaeological cultural lineage in the eastern Jianghuai 江淮 region and for studying the relationship between the Liangzhu Culture and the local culture, thought to be a regional phase of the Dawenkou 大汶口 Culture (Lin Liugen 2015).

The Liangzhu Ancient City 良渚古城 is located in Pingyao 瓶窑 town in the Yuhang 余杭 District of Hangzhou 杭州 City, Zhejiang 浙江 Province. From 1987 through 2013, survey and other research on ancient water control engineering on the periphery of the Liangzhu Ancient City generally revealed an entire water system. An entire dam system was identified, found to be composed of many sections of artificial dams and natural hill bodies, that can be divided into upper and lower sectors. Radiocarbon dates show that the dam system dates to the early and middle Liangzhu Culture period, or about 3300–2900 BC. The consistency of the structure of the dams, and their building techniques with typical remains of the Liangzhu Culture, also provide evidence for their dating to the Liangzhu Culture. The water control engineering might have multiple functions, including flood control, transportation, domestic water supply, irrigation, etc. As such, it also has a direct relationship with the economic and social development of the societies of the Liangzhu Culture and the emergence of the Liangzhu Ancient City (Liangzhu 2015a). The Zhejiang Provincial Institute of Cultural Relics and Archaeology excavated dike features belonging to the water control system at Laohu 老虎 Hill, Liyu 鲤鱼 Mountain, Shizi 狮子 Mountain, and other locations from July 2015 to January 2016, providing better understanding of the structure of the dikes and more stratigraphic information. These excavations confirmed that the Liangzhu water control engineering system is composed of 11 artificial dikes connecting valleys and hills, and it was a part of a construction plan for the outside of the city from its

beginning ca. 5000 years ago. It has been confirmed that the Liangzhu Ancient City consisted of palaces, inner city and outer city walls, and the water control engineering around its periphery. It is thought to be among the best preserved early capital structure systems found throughout the world (Liangzhu 2015b). The water control engineering of the city, in the form of dams functioning for flood control, is obviously different from the water control engineering of the early civilizations of Egypt and Mesopotamia, which consisted of canals and holding facilities with the main purpose of bringing in river water to the cities. These differences between Eastern and Western civilizations are of great value in research on the history of world civilizations (Wang Ningyuan 2015).

Beginning in 2012, the Institute of Archaeology of the Chinese Academy of Social Sciences and the Hainan 海南 Provincial Museum jointly carried out a series of field surveys and excavations in the southeastern coastal area of Hainan Province and found more than 30 prehistoric sites, including Gangshan 岗山 and Zoufeng 走风 in Lingshui 陵水 County. Meanwhile, they excavated the Yingdun 英墩 site in Sanya 三亚 City, and the Lianziwan 莲子湾 and Qiaoshan 桥山 sites in Lingshui 陵水 County. These allowed the establishment of the basic chronological framework for prehistoric cultures along the southeastern coast of Hainan, and the discoveries have filled in many blanks in the prehistoric archaeology of this area. The stratigraphic evidence and artifacts in the Yingdun, Lianziwan, and Qiaoshan sites reveal three new kinds of Neolithic cultures with different cultural implications. With the Yingdun site and Qiaoshan site as the fulcrum, the chronology of the prehistoric culture lineage of the coastal area of southeastern Hainan has been established. The first unearthed prehistoric tomb in Hainan was found at the Qiaoshan site and provides material for research on the local inhabitants' physical characteristics and DNA information, etc. The abundant aquatic and land animal remains unearthed from the Lianziwan and Yingdun sites provide important information on the natural environment and subsistence activities in the local area (Fu Xianguo 2015).

Two seasons of rescue excavations conducted at the Dongshancun 东山村 site in Zhangjiagang 张家港 City, Jiangsu Province, from August through November 2008 and March 2009 through February 2010, uncovered a total area of ca. 2300 sq. m. The excavations revealed a settlement belonging to the Songze 崧泽 Culture, which included house foundations, ash pits, burials, etc., as well as a set of high-ranking, large burials of the early and middle phases of the Songze Culture for the first time in the circum-Lake Tai 环太湖 area. All of the small burials of the Songze Culture were found in Zone I of the site, all of the house foundations were found in Zone II, and all of the high-ranking, large burials were found in Zone III. In addition, several dozens of burials of the Majiabang 马家浜 Culture were also recovered. The remains of the Majiabang Culture belong to the late phase of this

culture and could roughly be divided into two stages, early and late. The Songze Culture remains could be divided into three phases and six sub-phases, the dates of which were 6000–5200 BP. The high-ranking burials of the Songze Culture found at the Dongshancun site provide valuable information previously lacking on high-ranking burials of the Songze Culture and also show the origins of the highly developed Liangzhu civilization. They thus, allow new understanding of the comprehensive features of the Songze Culture in the circum-Lake Tai region and its level of social development and productivity. The separate areas for the large versus small burials and the emergence of the large house foundations in the early and middle Songze Culture show that at least by 5800 BP, there is clear social polarization, and social stratification has appeared. Dongshancun provides new archaeological data on the emergence of civilization in the lower Yangtze River, and these are also significantly meaningful for research on the origin of Chinese civilization (Dongshancun 2015a, b).

The seventh season of excavations, in 2011, at the Xipo 西坡 site in Lingbao 灵宝 City, Henan Province, exposed two large-sized, semi-subterranean house foundations, F107 and F108, with F108 superimposed on F107. These houses belong to the Miaodigou 庙底沟 Culture and are thought to date about 3900 BC. The internal area of F107 is about 169sq m, and its doorway is oriented to 198°. The construction process of F107 involved the trimming of the semi-subterranean house body, digging post ditches, erecting posts, ramming the walls, building the hearth, paving the living floor, etc. The size of F108 was similar to F107, while its doorway was oriented to 295° and thus facing toward the central plaza of the settlement (earlier excavated houses F105 and F106 also faced the plaza). Pottery, stone implements, and animal bones were unearthed from F107. The excavation of these two large-sized house foundations provides new data for understanding house construction and the design evolution of large-sized architecture in the Xipo settlement (Xipo 2015).

From the autumn of 2011 to the autumn of 2012, the Shanxi Archaeological Team of the Institute of Archaeology, Chinese Academy of Social Sciences, and other institutions excavated a large-sized, rammed-earth foundation at the Longshan 龙山period Taosi 陶寺 city site (Xiangfen 襄汾 County, Shanxi 山西 Province) within an area suggested to be a handicraft zone in the southwest of the site. This architectural foundation, thought to date from 2500 through 1900 BC, was in a circumscribed rectangular, or *hui*-shaped, plan with curved corners, and it consisted of the foundations of a central building, west, east, and south surrounding walls, a gate, and a courtyard, covering an area of more than 1200 sq. m. The huge scale of this architectural foundation, its regular layout, and special structure might be related to the management and control of handicraft production at Taosi (Taosi 2015).

In a recent study of pottery *ding*-tripods of the Neolithic Age in China, Han Jianye (2015) argues that they belong to one large tradition that experienced five developmental stages. First, pottery *ding* originated in the Central Plains around 6200 BC and then extended into the lower reach of the Yellow River and the middle and lower reaches of Yangtze River around 5000 BC. Around 4200 BC, this tradition diffused into the Liaodong 辽东 Peninsula from the lower reaches of the Yellow River. Around 3500 BC, it expanded into the northern part of South China, and after 2500 BC, this tradition was introduced into most other areas of South China. During the entire 4000-year development process, the Central Plains was always the core area, and the middle and lower reaches of the Yellow and Yangtze Rivers always remained the main body of the pottery *ding*-tripod tradition, despite its continuing expansion into other regions (Han Jianye 2015).

Xu Yongjie (2015) points out that the chronological and cultural relationships between the Banpo 半坡 and Miaodigou 庙底沟 Cultures are important in considerations of the construction of the cultural-chronological system for the Neolithic in China. The chronological relationship between these two cultures can be discussed through observing their superimposition and intrusional relationships and the co-existence of the same cultural elements and same kinds of artifacts belonging to each of these two cultures. Phase I of the Banpo Culture, dating around 6800–6600 BP, is earlier than the Miaodigou Culture represented by the Quanhucun 泉护村 site, which has the earliest Miaodigou remains known to date. Phase I of the Miaodigou Culture could be as early as Phase II of the Banpo Culture, ca. 6600–6400 BP; Phase III of the Banpo Culture and Phases II and III of the Miaodigou Culture are simultaneous in their development, and both cultures ended roughly at the same time, around 6200 BP (Xu Yongjie 2015).

Wang Weilin (2015) summarizes the records concerning *bi* jade discs in transmitted texts and relevant archaeological discoveries in the Liangzhu Culture and the Hongshan 红山 Culture in order to shed new light on the concept and origin of this type of jade object. According to recent discoveries of *bi*, jade *cong* tubes, and color-painted pottery with similar iconographies from the Yangguanzhai 杨官寨 site in Gaoling 高陵, the Anban 案板 site in Fufeng 扶风, and the Quanhucun 泉护村 site in Huaxian 华县, he suggests that *bi* jade discs as ritual paraphernalia might have been developed first in the Central Plains areas during the Miaodigou period (Wang Weilin 2015).

Lastly, in two other significant research papers, Li Xinwei (2015) discusses the long-distance exchange networks of the upper-class in prehistoric society and how they formed in China (Li Xinwei 2015). Zhang Xingde (2015) re-examines the Hongshan Culture during the Hougang Phase I Culture (Zhang Xingde 2015).

3 Xia, Shang, and western and eastern Zhou dynasties

New archaeological discoveries of the Xia and Shang Dynasties were few for 2015 but very important. Scholarly discussions concerned cultural character, evolution, and interaction, as well as handicraft production.

From November 2012 through May 2013, the Erlitou Archaeological Team of the Institute of Archaeology, Chinese Academy of Social Sciences, worked on a rammed-earth wall with a roughly north-south orientation (Q7) discovered in the wall-enclosed workshop zone of the Erlitou 二里头 site, as well as hard-packed road surfaces found distributed along both sides of the wall. The wall might have been built in Phase II of the Erlitou Culture, around 1700–1650 BC, and used through the early stage of Phase IV. The roads were in use from Phase II to Phase III or the early stage of Phase IV. Referring to previous discoveries, the excavators suggest that this rammed-earth wall should be the west wall of the wall-enclosed handicraft workshop zone or the east wall of another zone to its west, and the roads were auxiliary facilities for the wall when it was in use (Erlitou 2015a). In addition, test coring in 2010 in the palace zone of the Erlitou site revealed a huge pit covering an area of over 2200 sq. m that was almost 7 m at its deepest place. The ground nearby was paved with calcareous nodules (*liao jiang* 料疆), showing that it was a special location. The *terminus ad quem* of this pit is Phase II of the Erlitou Culture, and the original intention for digging it would have been for quarrying earth for the construction of the large-scale rammed-earth architectural foundations. Sectioning of this pit recovered four complete piglet skeletons lying orderly in the same posture, one small house foundation, one potsherd heap, one potsherd-paved path and many hard-trodden paths, hinting that sacrifices and living activities were conducted after the forming of this huge pit. It gradually silted and was refilled in later times, with in-filling occurring up to Phase IV of the Erlitou Culture (Erlitou 2015b).

At the Yanshi Shang City 偃师商城 site, supplementary excavation completely revealed the full-view of Hall Foundation No. 3, located in the southwestern corner of the palace city. The building could then be recognized as the first row of the western triple palace complex. The excavations proved that a previous suggestion that the extension of this hall had been built from east to west was wrong; instead, it became clear that the west corridor of the western row was built first and the west corridor of the eastern row was the extension. In the middle of the south corridor, a gatehouse with three gateways was found, and the settings of the gateways in the early and late phases were different. These revisions to our understanding of the layout of the palace complexes has also propelled forward our understanding of the entire palace city (Yanshi Shang City Site 2015).

Between 2002 to 2008, three seasons of excavations were conducted on a bone workshop site of the Yinxu 殷墟 Culture period at Tiesan 铁三 Road in Anyang City, Henan Province. These revealed that the general area of this workshop was about 1.76 ha. The features recovered in the site were mainly roads, house foundations, ash pits, and burials, and the artifacts unearthed from these included pottery, bronzes, and jades, but the most prominent artifacts were worked bone materials. The bone workshop started to operate at the latest in Phase II of the Yinxu Culture period and lasted until Phase IV, or ca. 1250–1046 BC. The large amount of worked bone materials provide important data for research on handicraft production, animal husbandry economy, and the utilization and supply of animal resources during the late Shang Dynasty (Yinxu 2015a).

From 2012 through 2015, the Anyang Archaeological Team, IA, CASS, recovered a group of remains of the Late Shang period at Dasikong 大司空 Village Locus East, which is located in an area shared by the traditional Yinxu site and the Huanbei Shang City 洹北商城 site. Recovered remains include house foundations, wells, ash pits, underground storage features, and paths. These date mainly to Yinxu Phases III and IV, but the earliest could be from the late stage of Phase I. These excavation data have significant academic value for understanding the distribution of Shang cultural remains in the joint area of Yinxu and the Huanbei Shang City, as well as for the planning of the part of the Shang Yinxu capital to the north of the Huan River (Yinxu 2015b).

Zhang Guoshuo (2015) argues that the so-called “inner-wall foundation” and “outer-wall foundation” of the Huanbei Shang City are actually not wall foundations at all. The so-called inner-wall foundation should belong to remains from the filling of an early moat, and so the outer-wall foundation would have belonged to the surrounding wall, and only wall, for the entire walled city. In other words, the wall existing during the usage of the site should be the so-called outer-wall. This wall, however, was abandoned before it was completely finished. Zhang demonstrates that the city’s layout embodies various characteristics of urban centers of early China. During the construction process, the structure of the capital changed from a palace walled-town with moat to a palace walled-town with an outer walled-town (Zhang Guoshuo 2015).

Tang Jinqiong (2015) notes in his paper that in burials yielding bronzes at Yinxu, pottery is also usually unearthed. The usage of this pottery, however, is different from that of the bronzes associated with it; moreover, the usage of the pottery vessels themselves also differed according to their vessel forms and locations in the graves. The different locations of the different pottery reflects not only the different steps of the interment ritual, but also the different roles of the spaces in the graves during the funeral rites and ceremonies (Tang Jinqiong 2015).

The Xichengyi 西城驿 site is located in a suburb of Zhangye 张掖 City, Gansu. Archaeological survey results show that the site was a copper smelting site dating 3600–2000 BC. A substantial amount of cultural remains have been collected, including pottery, stone implements, ore, slag, and copper pieces belonging to the Qijia 齐家 Culture, Siba 四坝 Culture, and a transitional-type period. The collected remains are crucial not only for exploring the relationships between the above cultures, but also for understanding the development of copper metallurgy in the Hexi Corridor 河西走廊 (Xichengyi 2015a). In 2010, the Gansu Provincial Institute of Cultural Relics and Archaeology and other institutions conducted cooperative excavations at the site. The excavation uncovered 150 sq. m in total, from which house foundations, walls, ash pits, ash ditches, and burials were found along with more than 1000 artifacts. The finds are significant for further research on the origin of the Siba Culture, early copper-based metallurgy in the Hexi Corridor, and other relevant issues, and they provide important materials for the exploration of early cultural communication between the East and the West (Xichengyi 2015b).

The Seima-Turbino Culture is an early Bronze Age culture of the Eurasian Steppe. The representative artifact of this culture—a socketed bronze spearhead with a side hook—has had 13 samples found in China. Metal compositional analyses and typological research on these 13 bronze spearheads show that they were mainly made of copper or arsenical copper by casting, and are later than the copper or arsenical copper objects of the West made by forging, which date correspondingly to the Late Neolithic or Early Bronze Age periods in China. These socketed bronze spearheads with side hook found in China are directly related to the Seima-Turbino Culture, and their diffusion along the prehistoric Silk Road and their influence on Chinese civilization reveals again that cultural communications between China and the West started on the Eurasian Steppe, and that the history of the development of Chinese civilization shows uninterrupted communication between the cultures of China and cultures of other regions of the world (Lin Meicun 2015; Liu Xiang 2015; Liu Rui, Gao Jiangtao and Kong Deming 2015).

Wang Lixin and Fu Lin (2015) point out that among the popular pottery artifacts unearthed at the Xiquegou 喜鹊沟 copper mine site (Hexigten Banner 克什克腾旗, Inner Mongolia), a kind of *li*-cauldron 鬲 with high neck, bulging belly, and lobed rim is generally believed to belong to the Late Shang period. The Xiquegou copper mine site is the earliest mining site found north of the Yangtze River to date. Seen from the surrounding ecological environment and terrain and the pattern of the residential remains, Xiquegou could not be a settlement with permanent residents, but was instead a seasonal settlement for mining activity. The food resources for the residents (or the miners), derived from animal husbandry or fishing and hunting. The discovery of this mining site

provides important clues for research on copper and tin resources used in the bronze metallurgy of the Central Plains during the Late Shang period (Wang Lixin and Fu Lin 2015). Based on this, the two scholars suggest that the pattern of archaeological cultures in western Liaoning become complicated during the Late Shang and Western Zhou period with the diminishment and vanishing of the Lower Xiajiadian 夏家店 Culture. Through close analyses and summarization of the characteristics of the pottery assemblages and other contexts, they distinguish five artifactual assemblages with different cultural characteristics in western Liaoning existing between the Lower Xiajiadian Culture and the Upper Xiajiadian and Linghe 凌河 Cultures: these are Houfen 后坟 remains, Weiyingzi 魏营子 burial remains, Xiangyangling 向阳岭 remains, Xiquegou remains, and Liunan 柳南 burial remains. Then, bronze hoards found in western Liaoning dating to the Late Shang and Western Zhou periods, based on their combinations of artifacts and distributions, can be divided into three groups. Group A belongs to the Xiquegou remains, Group B belongs to the Houfen remains, and Group C maybe belongs to the other remains mentioned above (Fu Lin and Wang Lixin 2015).

The Zhouyuan 周原 site, thought to be the birthplace of the Zhou Culture, is located at the border of Fufeng 扶风 County and Qishan 岐山 County in Baoji 宝鸡 City, Shaanxi 陕西 Province. The site covers a total area of about 33 sq. km. From September 2014 to December 2015, the Zhouyuan archaeological team, consisting of members from the Shaanxi Provincial Institute of Cultural Relics and Archaeology, School of Archaeology and Museology, Peking University, and the Institute of Archaeology, Chinese Academy of Social Sciences, carried out a new round of archaeological work at this site. They exposed two rammed earth buildings, one residential and burial area, two chariot-horse pits, and also excavated trenches through five pool and canal related features. Among the buildings, Fengchu 凤雏 Building No. 3 is the largest building excavated dating to the Western Zhou Dynasty to date and adds further support to the importance of the Fengchu building group. The building also is the first to show the concentric double rectangular layout (or *hui* 回-shaped layout) from the Western Zhou Dynasty, and it also provides new material for research on the evolution of Western Zhou architecture. In the courtyard of Fengchu Building No. 3, archaeologists unearthed the first stele and pavement stone traces ever discovered as sacrifice remains of the Western Zhou Dynasty, and these are of great academic value. The discovery of the water network system in the Zhouyuan site further strengthens the understanding of many important relics found in the past that can now be seen as associated with it, deepens the understanding of the process of settlement expansion and the nature of the water supply to

the settlement, and fills lacuna in what we knew about the water supply *chi yuan* 池苑 system in the capital of the Zhou Dynasty (Wang Zhankui and Lei Xingshan 2015).

In the Feng 丰 capital and Hao 镐 capital sites of the Fenghao 丰镐 site of the Western Zhou Dynasty, remains of bone workshops were found at Zhangjiapo 张家坡, Xinwang 新旺, and Fengcun 冯村 villages. These can be confirmed as bone workshops from the evidence for bone implement production, bone processing workflow, and the settlement patterns of the sites. The bone industry in the Fenghao site was rather developed, and this can also provide strong evidence to support that the Fenghao site is the capital site. The settlement remains nearby the bone workshop sites show that special people were assigned to be in charge of the production of the bone implements and management of the workshops, and that the concentrated management of different handicraft industries might also exist (Fu Zhongyang 2015).

Li Feng (2015) proposes a new interpretation for the casting technique for Western Zhou bronze inscriptions, especially those cast in raised grids. In fuller consideration of the various phenomena seen on the bronzes, he suggests a nine-step workflow in which transitional molds were employed to produce the real casting core with intaglio grids and raised characters to be used for the final casting. This new theory not only fully explains the production of long inscriptions with intaglio texts and raised grids, but also explains the technical details behind a number of recently discovered special inscriptions (Li Feng 2015).

Chen Xiaoshan (2015) points out that a bronze *he*-pitcher 盃 presenting typical Wu-Yue 吴越 stylistic features was discovered in tomb M85 of the cemetery of the Ying 应 state at Pingdingshan 平顶山 City, Henan Province. By comparing this vessel with similar bronze vessels and well-dated tombs in the Central Plains, the author could confirm that the date of this particular bronze *he*-pitcher cannot be later than the end of the Middle Western Zhou period. Following this lead, he compares its design with six other *he*-pitchers of similar style in order to establish a better chronological sequence and draw conclusions about cultural communications between the Central Plains and the middle and lower reaches of the Yangtze River during the Erlitou Period through the Late Shang period. The author believes that the bronze industry of the Wu-Yue region began during the Early Western Zhou period (Chen Xiaoshan 2015).

Jing Zhongwei and He Feifei (2015) analyze two well-preserved elite tombs of the Zhou period excavated at Wanggudao 王古道 village in Anyang City, Henan, from August through September 2004. The research results show that the occupant of tomb No. 2 was the husband while that of tomb No. 1 was the wife. In other words, the two tombs' owners should be a couple belonging to lower rank elites, or *shi* 士 of the Wei 卫 state. These two burials should date to either the end of the Western Zhou or the early stage of the

Early Spring and Autumn period. They point out that three objects in the original report were misnamed by the excavators. For instance, the long, thin bronze sheets unearthed from tomb No. 1 should be called *sha* 鬲, which were used as decorations covering the coffin and as ritual paraphernalia symbolizing an elite's status. In addition, the rectangular fish-shaped bronze decorative pendants which were strung and surrounded the coffin of tomb No. 1 indicate that the owner's rank might correspond to the class of *shi yi chi* 士一池 mentioned in texts (Jing Zhongwei and He Feifei 2015).

The Tonglüshan 铜绿山 site in Daye 大冶 City, Hubei 湖北 Province, is a famous Chinese copper mining and smelting site. In coordination with the construction of the National Archaeological Heritage Park of Tonglüshan and the site selection for a new museum of copper mining and smelting, the Hubei Provincial Institute of Cultural Relics and Archaeology established the Archaeological Team of Ancient Copper Mining and Smelting in cooperation with other excavation conductors in 2011. The team focused on survey and salvage excavations of the area where ore body VII is located, then discovered and excavated the Yanyinshanjiao 岩阴山脚 site, the Sifangtang 四方塘 site, and its cemetery successively. These works brought significant achievements. From November 2014 to November 2015, 135 tombs were unearthed in the eastern, low-lying areas of the Sifangtang site. This is the first cemetery ever found that is directly related to a mining site in China. The funerary objects in different tombs suggest differences in the division of labor, show categories of technology employed by the tombs' occupants, and reveal information concerning differences between managers and laborers. It is also the first time that general information about the industrial chain for mining in the Tonglüshan site has been exposed. The unearthed slag, copper ore, and bronze objects provide new data for research on the metallurgical process and technologies of the Tonglüshan site (Chen Shuxiang 2015).

From October 2011 to December 2012, the Jingzhou 荆州 Museum (Hubei Province) conducted the first season of excavations at the Fengjiazhong 冯家冢 cemetery, during which seven small-sized tombs of the Chu 楚 state dating to the Warring States period were recovered. All of these tombs were vertical earthen shaft pit tombs with the opening larger than the bottom, and the remains of a mound built of light gray earth were seen at the openings. These tombs were orderly arranged, their sizes were similar, their orientations were the same, and their spacing was even; all of these show that this cemetery was carefully planned, and the tombs should be the attendant tombs of Fengjiazhong Tombs Nos. 1 and 2. This arrangement is very similar to that of the attendant tombs in the Xiongjiazhong 熊家冢 cemetery in Jingzhou, and they would have been constructed according to the same ritual system. A set of pottery ritual vessels imitating bronzes unearthed from one of these seven tombs (JBF BX13),

includes a *ding*-tripod, *dui* 敦 tureen, *fou* 缶 jar, *pan* 盆 basin, and *yi* 匜 pourer: These had traits clearly belonging chronologically to the late stage of the Early Warring States period to the early stage of the Middle Warring States period. Considering all of these features, the date of this cemetery could be also defined to around the late stage of the Early Warring States period to the early stage of the Middle Warring States period (Fengjiazhong 2015a). From March through May 2013, the Jingzhou Museum excavated nine sacrificial pits near tomb No. 1 in the Fengjiazhong cemetery, and these pits were dated to the Warring States period (Fengjiazhong 2015b).

Among the states of the Eastern Zhou period, the quantity of bronzes discovered to date from the Chu cultural region, and the completeness of their chronological sequence, are second to none. The establishment of the Chu bronze chronological sequence has become the basis for in-depth research on the Chu Culture, as well as a major reference for cross-dating bronzes from other states in the Eastern Zhou period. Yuan Yanling and Zhang Wenjie (2015) make a systematic study of the bronzes of Chu published before 2013 and show that beginning from the Middle Spring and Autumn period, the relatively complete developmental sequence of Chu bronzes began to form, and the style of the bronzes of this system lasted until the Late Warring States period. The development of Chu bronzes could be divided into seven phases according to traits and assemblages. The bronze assemblages unearthed from burials of people of different ranks show differences in vessel forms and numbers and in décor on the bronzes, as well as differences in their stability and change. For example, the bronze assemblages unearthed from burials lower than *da fu* 大夫 rank usually show clear changes, while that of the bronzes of their "Category A" unearthed from the burials of *da fu* and higher ranking people tended to maintain more traditional elements through time (Yuan Yanling and Zhang Wenjie 2015). In a related study, Yuan Yanling (2015) analyzes Chu-style bronze *ding*-tripods, classifying them into the following types: *ding*-tripods with a constricted waist and flat bottom, *ding*-tripods with a ring of ridge on the rim, *ding*-tripods with a recessed rim to fit the lid, *ding*-tripods with outward-bending rim and constricted neck, and *ding*-tripods with a mouth. The *ding*-tripod with a constricted waist and flat bottom was usually associated with *gui*-tureen 簋 and wine vase with dragon-shaped handles and only seen in high-ranking burials such as that of the *da fu* or higher officials; the *ding*-tripod with a ring of ridge on the rim and the *ding*-tripod with outward-bending rim and constricted neck were usually associated with *fu*-food vessel 簠, *yu fou*-urn 浴缶, and *zun fou*-urn 尊缶 and very popular in the Middle through Late Spring and Autumn period; the *ding*-tripod with recessed rim to fit the lid was usually associated with the *dui*-tureen 敦 and wine vase and popular in the Warring States period. The numbers of some of the *ding*-tripod types in the burials also seem

to reflect socio-political status. For example, the *ding*-tripod with constricted waist and flat bottom roughly followed some rules showing a decreasing sequence of nine, seven, five, three, etc., likely indicating the position of the tomb occupant in the socio-political hierarchy. The different assemblages and types of the ritual vessels are also a reflection of the demands of different ritual activities (Yuan Yanling 2015).

The Qin 秦 Duke Mausoleums on the Sanshi Plateau 三时塬 in the southern suburbs of Yongcheng 雍城, Shaanxi, are the largest cluster of Qin mausoleums so far found. Their magnificent scale and complete layout, which are rarely found in other states, provide the best evidence by which to explore the Qin mausoleum system and its long-lasting and influential complete and unique design. In 2009 and 2010, the Shaanxi Provincial Institute of Archaeology collaborated with local archaeological institutes to conduct the third investigation at the No. 1 and No. 6 Qin Duke Mausoleums. New findings include the middle mausoleum moats and accompanying tombs outside the mausoleum moats and provide new clues regarding the layout of the mausoleums and the nature of the tombs and outside chambers (Qin Duke Mausoleums 2015a). Four tombs and three chariot pits excavated among 708 medium and small tombs and chariot pits outside the moat of the No. 6 mausoleum show that their occupants should be members of the elite. Unfortunately, the spatial layout of the tombs offers little information to draw any conclusions about the relationship between the commoners' cemetery and the mausoleums. The excavators propose that according to the mortuary practice of honoring the West, these tombs might be associated with the No. 4 or No. 10 mausoleum (Qin Duke Mausoleums 2015b). In addition, the newly found No. 14 mausoleum is relatively separated from the other mausoleums. This raises an essential question about the nature of its occupant. A tomb found with chambers and ramps shaped like the character *feng* 丰 also provides new clues to investigate the layout of the Qin mausoleums (Qin Duke Mausoleums 2015c).

From January through August 2012, the Shijiahe 史家河 cemetery of the Warring States period in Adang 阿党 town of Huangling 黄陵 County, Shaanxi, was jointly excavated by the Shaanxi Provincial Institute of Archaeology and the local institute. The 37 burials excavated and their abundant artifacts not only complement understanding of the genealogy of the archaeological cultures of the northern Shaanxi region, but also provide a referential dataset for the investigation of contemporary remains (Shijiahe 2015). The excavators address the issues of the date, layout, funeral practices, and ethnic affiliation of this cemetery. The cemetery primarily dates to the Middle Warring States period, but with a few graves dating to earlier or later periods. The assemblage of funeral goods includes multiple components from various cultures such as the Xirong 西戎 Culture, the Qin 秦 Culture, and the Three-Jin 三晋 Culture. In addition, some components in the

assemblage clearly demonstrate a connection with Steppe-style bronzes from the Northern Zone. This mosaic pattern indicates a shift in the nature of the cemetery through time. During the Early and Middle Warring States period, this cemetery was occupied by the Rong 戎 ethnic group which was closely related to the Wei 魏 state. Later, this region was conquered by the Qin state and primarily occupied by Qin residents (Sun Zhouyong, Sun Zhanwei, and Shao Jing 2015).

Zhang Liang and Teng Mingyu (2015) divide Eastern Zhou tombs yielding bronzes in southern Shanxi into four chronological phases according to changes in the assemblages and types of grave goods. Statistical analysis of variables such as grave size, layers of coffins, quantity of bronze vessels, chariot and horse fittings, bronze weapons, and tools, and pottery in the tombs leads them to distinguish high, medium, and low class graves in each chronological phase as well as changes within each class through time. They thus reveal the development and evolution of the tombs yielding bronzes and the cultural features and social structure in southern Shanxi during the Eastern Zhou period. They suggest that political factors were the main cause for the appearance of different classes of tombs, and that the tomb occupants from each class of tombs would belong to different social classes (Zhang Liang and Teng Mingyu 2015).

In a systematic analysis of remains from the various archaeological cultures of the Eastern Zhou through Qin Dynasty periods in northern China, Shan Yueying (2015) puts forward that there were two cultural zones (the north and south cultural zones) during this period. The two zones feature clearly different cultural features and connotations, and the people living within northern China bear clearly different physical characteristics. Shan also considers regional differences in each cultural zone and their developments and changes. She points out that the cultures in the south cultural zone could not be regarded as a part of the early Iron Age cultures of the Eurasian Steppe, but rather a kind of culture peculiar to a transitional zone between the cultures of the Eurasian Steppe and that in the Central Plains. The development and evolution of the north cultural zone, which emerged in the Middle to Late Spring and Autumn period, can be divided into three clear phases: the first phase was a part of the early Iron Age cultures of the Eurasian Steppe. During the second phase, the cultural features and connotations of this zone began to stray away from the cultures of the Eurasian Steppe, which could be closely related to the military conquest and political management by the states of the Central Plains and the powerful northward advance of the cultures of the Central Plains. By looking at the processes of the sinicization of the Rong 戎, Di 狄, and Hu 胡 ethnic groups in northern China, and through reference to the relevant historic literature, she makes further observations concerning the interactions among the states of the Central Plains and the peoples in these two cultural zones and the changes of the cultural patterns in each of the two

cultural zones. She points out that the Hu ethnic group lived in northern China since the Middle Spring and Autumn period, and the later appearance of the Hu people in the historic literature must be related to the northward advances of the territories of the states of the Central Plains rather than the southward invasion of the nomadic tribes who were living in the Mongolian Plateau (Shan Yueying 2015).

When we analyze the cultural remains in the Steppe at the initial stage of the nomadic societies in the early first millennium BC, we can find that they are mainly distributed on the north bank of the Black Sea and in the Kuban River Valley, southern Siberia, the Mongolian Plateau, and in southeastern Inner Mongolia. Shao Huiqiu and Yang Jianhua (2015) discuss the cultural interaction between these regions through the comparison of the Upper Xiajiadian Culture in southeastern Inner Mongolia with other Steppe cultures. Their research reflects that from the formation of the Upper Xiajiadian Culture in the Early to Middle Western Zhou period, there was interaction between this culture and the Slab Grave Culture in the Mongolian Plateau. During the prosperous period of the Upper Xiajiadian Culture, this interaction still remained, but there was also synchronous developments between the Upper Xiajiadian Culture and the Arzhan tombs of Tuva in southern Siberia, indicating the expanding scope of this Steppe cultural interaction. The curved animal motif discovered widely in the Eurasian Steppe represents the synchronization of the “Steppe Metal Route” extending through this vast region at this time (Shao Huiqiu and Yang Jianhua 2015).

4 The Qin and Han dynasties

The tomb of Marquis Haihun 海昏 is located at Dundun 墩坪 Mountain, about 500 m northeast of Laoqiu 老裘 village in Datangping 大塘坪 Town in the Xinjian 新建 District of Nanchang 南昌 City, Jiangxi 江西 Province. The tomb was discovered in March 2011 because it had been robbed. Subsequently, the Jiangxi Provincial Institute of Cultural Relics and Archaeology conducted archaeological survey and coring over a 5 sq. km area around the tomb. Over 5 years, they systematically cored an area of 1 sq. km and excavated around 10,000 sq. m, gaining important archaeological achievements, including finding a series of important remains associated with Marquis Haihun’s state, including the Zijin 紫金 city ruins, the family cemetery of Marquis Haihun, and tombs for the nobles and common people. They confirmed that the Zijin city covered an area of 3.6 sq. km and was the capital of the Haihun state during the Han Dynasty. The cemeteries of generations of the nobility and common people were located to the west and south of the Zijin city site. This is the largest and best preserved settlement site of a Han Dynasty regional state that has been found so far, and it has the most abundant cultural content found so far in China, as well. The

cemetery of Marquis Haihun is trapezoidal, covering an area of about 4.6 ha. With tombs of Marquis Haihun and his wife at the center, there are 7 affiliated tombs, a burial pit, walls, and north and east gates. There are also funeral towers, bedroom halls, ancestral halls, temples, and accommodations for management officials within the cemetery, as well as a road system and drainage facilities. Some affiliated tombs also feature associated ancestral halls. This cemetery of the Western Han Dynasty features the best preservation, the most integral structure, the clearest functional layout, and the most complete ritual system found so far in China. The tomb of Marquis Haihun is a typical example of the Marquis class’ tombs during the late Western Han Dynasty, featuring a grand scale and a chamber design with a complex structure with a clear division of functions. It will contribute to understanding the burial system of Western Han Dynasty feudal lords. Moreover, more than 10,000 exquisite artifacts have been excavated, representing nature of the life of the nobility during the Western Han Dynasty. These have high historical, artistic, and scientific value (Yang Jun 2015).

The urban planning system of Luoyang 洛阳 City during the Han 汉 and Wei 魏 Dynasties is a continuation of the Qin and Han systems as well as the source for the Sui 隋 and Tang 唐 city, and thus plays a significant role in the history of the Chinese ancient capital system. The Taiji 太极 Hall site is located in the northwest to the middle part of the palace of the Northern Wei 北魏 Dynasty, about 1 km north of Jin 金 village of Pingle 平乐 Town, Mengjin 孟津 County, Henan Province. The hall is located 460 m south of the Changhe 阊阖 Gate site of the palace. Since 2012, in order to protect the cultural heritage, the Archaeological Team of Han and Wei Dynasty Luoyang City from the Institute of Archaeology, Chinese Academy of Social Sciences (IA CASS), carried out systematic surveys and excavations and acquired a preliminary understanding of the range, layout, and temporal changes in the structure of the site. According to historical records, the Taiji Hall is the main place for holding important events during the Cao-Wei 曹魏 Dynasty, the Western Jin 西晋 Dynasty, and the Northern Wei Dynasty. The east and west halls of the Taiji Hall are where the emperor would make decisions about policy, hold banquets with his ministers, lectures, and other activities, and so the Taiji Hall is well-deserved to be called a “political center.” It is also the first palace with single axis symmetry, and thus ushers in a new age of Chinese palace construction and capital layout, with a single palace centered at Taiji Hall: the Taiji Hall served as the *Da Chao* 大朝, a place for holding important events. The juxtaposed east and west halls served as the *Chang Chao* 常朝, a place for carrying out daily affairs, and from this the East and West Hall System 东西堂制度 was born. The three gates in front of the main hall and the three main halls line up from south to north, thus comprising the Five Gates with Three Halls System 五门三朝. Thus, this palace layout system of

Luoyang City during Han and Wei Dynasties had a far-reaching influence on the subsequent development of the capital city system (Qian Guoxiang 2015).

From 2009 to 2011, the Archaeological Team of the Qinshihuang Mausoleum Museum conducted partial excavation of the Terracotta Army Pit No. 1. The excavation locale was slightly to the north of the center of the pit and included two trenches and three partitioning walls that were all part of the pit, covering 200 sq. m in total. Pit No. 1 is a subterranean earth-and-timber structure formed of earthen structures with wooden pillars and beams, and the bases of the two trenches were all paved with bricks. A total of 106 terracotta figures were recovered from the trenches along with 96 figure feet and pedestals and a large amount of weapons and chariot and horse fittings. The construction of the pit is thought to date sometime between 228 and 209 BC. This excavation provides new clues concerning the destruction of the terracotta army pits of Emperor Qin Shihuang's mausoleum and new materials for a wide range of research issues (Terracotta Army Pits of Emperor Qin Shihuang's Mausoleum 2015).

In 2014 and 2015, the Joint Wei Bridge Archaeological Team excavated an ancient shipwreck in the sand deposits to the south of the bank of the Wei 渭 River at the Wei Bridge site, located to the north of the Han Chang'an 长安 City. The ship had broken into east and west sections and toppled into the sand; the remaining parts were bow planks, full-length wales, transverse beams, hull planks, ribs, etc. The unearthed artifacts show that this ship was built during the Han Dynasty and belonged to the mature wooden plank ship type: it is the first archaeological discovery of this type in China. This ship's building technique was popular in the Mediterranean area during the Roman period, and therefore its remains are meaningful for the study of cultural communication between Chang'an and Rome, which were the two ends of the Silk Road (Wei qiao kao gu dui 2015).

From May 2008 through November 2012, the Liaoning Provincial Institute of Cultural Relics and Archaeology excavated the Miaopu 苗圃 cemetery in Liaoyang 辽阳 City, Liaoning. The terrain of the cemetery was the terrace on the west bank of the Taizihe 太子河 River at the southeast corner of Liaoyang City. Covering an area of about 50 ha in total, the cemetery was about 1.5 km to the west of the course of the Taizihe River. In the past, burials of the Han Dynasty to the Three Kingdoms period had been found in the surrounding areas. Among the tombs excavated this time were four earthen shaft pit tombs of the Han Dynasty; they were each furnished differently, with a single coffin, a single outer coffin, and a double inner coffin, and a single outer coffin and triple inner coffin. Grave goods included mainly pottery, plus bone implements, glass objects, and a few metal objects. The main types of the pottery were vats, *lian* 奩 cosmetic boxes, vases, *zun* 尊 wine jars, *ding*-tripods, and various models of household items such as ovens and wells, basins, etc. Bronze coins in

the tombs included *ban liang* 半两 and *wu zhu* 五铢, and other objects included silver finger rings, bronze rings, bronze belt hooks, glass earrings, and bone tubes. A comparison of these grave goods with their counterparts unearthed in nearby areas hints that the dates of these four tombs ranged from the early to late Western Han to the early Eastern Han periods (Miaopu Cemetery 2015a). The structures of 19 stone-built tombs excavated were diverse, including single-cist, single-chamber, triple-chamber, and multi-chamber tombs. The single-cist tombs were in a simple form without a passage, and all of them were rectangular in plan. The single-chamber tombs were in a P-shaped or T-shaped plan. The triple-chamber tombs feature three chambers built abreast and linked to each other through square holes, and grave good platforms were built in them. The multi-chamber tombs were in T-shaped plans or plans resembling the characters 凸-, 工-, and 土: the structures were complicated, and the stone slabs or boards used to build them were regularly cut and laid firmly. Rich grave goods were unearthed from these tombs, most of which were pottery wares. There were also a few silver and bronze items and stone and bone objects. In total, 438 pieces of grave goods were unearthed (Miaopu Cemetery 2015b).

Tombs of the Han Dynasty have been found to be located to the west of Taojiazhai 陶家寨 village in the northern suburbs of Xining 西宁 City, Qinghai 青海. In the 1980s and 1990s, the Qinghai Provincial Institute of Cultural Relics and Archaeology conducted excavations in this locality. In October 2011, two brick-chamber tombs were revealed in the course of urban construction, and archaeologists conducted rescue excavations of them. Both of the tombs were single-chamber tombs consisting of a ramp passage, entrance, and tomb chamber with vaulted roof. In all, 31 pieces (or sets) of grave goods, including pottery, bronzes, lacquered wooden objects, and glass ornaments, were unearthed. The tomb structure and unearthed artifacts show that the date of these tombs is from the Wang Mang 王莽 Interregnum to the middle Eastern Han period. The glazed pottery is the first discovery of glazed pottery wares from this time period in Qinghai and is also the earliest glazed pottery found in Qinghai to date. The pottery model of a freestanding toilet is also the only such object found to date (Taojiazhai 2015).

In his study on settlement distributions during the Han Dynasty, Kim Byung-joon (2015) inferred the locations of settlements through the distributions of the burials, as he noticed they frequently are located together. In addition to culling information from excavation reports and published materials from several provinces, Kim precisely calculated the distances between cemeteries and county seats using GPS survey. The results show that most of the burials of the Western Han Dynasty were distributed on the periphery of the county seats. Based on this, Kim argues that the common farmers would have been living inside or nearby the county seats. Moreover, this also demonstrates that by the Western

Han Dynasty, state control over local populations was thoroughly put into effect based on the governing system of *bian hu qi min* 编户齐民 (registering common people). During the Eastern Han Dynasty, settlements were no longer limited to the periphery of the county seats and were even scattered randomly in areas far from them. These features coincide with records showing a collapse of local control by central elites because of social turmoil, and this resulted in the formation of new settlements in places far from the county seats; these settlements form in association with the construction of castles and manors by powerful families. These situations are interpreted as showing that it had become more difficult for state power during the Eastern Han to extend into local settlements as it had during the Western Han Dynasty. In the Eastern Han Dynasty, the old ruling methods became somewhat restricted and new ruling forms were attempted, and the distribution pattern of the settlements could provide a reason for these attempts. It is hard to identify whether a settlement was a natural village or an administrative village, but the fact that in the Western Han Dynasty the settlements were concentrated at the periphery of the county seats supports this pattern as resulting from intentional organization under the influence of state power, so these settlements must have had a strong flavor as administrative villages. In the Eastern Han Dynasty, new settlements were formed far from the county seats, and therefore they would have had more features of natural villages (Kim Byung-joon 2015).

In the Han Dynasty, the Nanyang commandery included the area of present-day Nanyang City, Henan, and the north part of Xiangyang City, Hubei. Song Rong (2015) explores the characteristics, developing process, and formation modes of the archaeological culture of the Han Dynasty in Nanyang through the comprehensive observation of Han burials in this area and with reference to the historic literature. The new research results show that the formation and development of the Han archaeological culture in Nanyang can be divided into three phases: the pregnancy phase in the early and middle Western Han period, the growth phase from the end of the Western Han to the beginning of the Eastern Han periods, and the mature and declining phase in the Eastern Han period. In the ideological field, the local culture of Nanyang began to integrate into the Han culture in the first phase, but complete integration did not occur until the last phase. The mode of the development of the Han culture in Nanyang was gradual, and the process of this development coincided with the “Great Unity” in the fields of ideas and politics, which could represent the culture formation mode coming from the political center of the Han Dynasty (Song Rong 2015).

Yang Wuzhan and Cao Long (2015) point out that the Baling 霸陵 mausoleum of Emperor Wendi 文帝 of the Western Han Dynasty does not have a tumulus mound built from the ground level. Archaeologists have previously argued that it was a cliff tomb or an earthen (stone) shaft pit tomb.

Here, analyzed through the historic literature, the natural topography, and the imperial burial tradition of the Western Han Dynasty, the authors argue that the structure of the Baling mausoleum would possibly be an earthen (stone) shaft pit tomb with four passages forming a cross-shaped plan, and the large tomb found at Jiangcun village might be the real Baling mausoleum. Emperor Wendi’s thrifty character and optimistic view on death would be the main reasons for not requiring a tumulus above his grave, while the admonitions of his officials might also have played a positive role (Yang Wuzhan and Cao Long 2015).

Li Yali and Teng Mingyu (2015) focus on the iconography concerning pavilions on Han Dynasty stone reliefs, first clarifying the terminology related to pavilions and then illustrating their developmental trajectory with an aim at better understanding the significance of pavilions in the history of ancient Chinese architecture. The authors propose that pavilions inherited features of terraced buildings predating the Han but gradually replaced them when more advanced wooden construction techniques were invented. Eventually, pavilions fully developed into water pavilions, which appeared in the Tang Dynasty (Li Yali and Teng Mingyu 2015).

Wang Yu and Tang Xiyang (2015) study that the emergence of the iconography of the Queen Mother of the West and argue that it was influenced by various types of Western goddesses instead of one single type. Therefore, its emergence made the interaction between the East and West during the Han Dynasty more dynamic and vivid. Han people usually thought the Queen Mother of the West was living in the land of the western region. During the gradual expansion of this religious practice as a “westward movement,” various belief systems of goddesses and various types of goddesses from the West were absorbed and became part of the iconography of the Queen Mother of the West. Although the authors argue that the beliefs and iconography are more than likely to have originated from an indigenous practice in China, there was a dynamic interaction between the Queen Mother of the West and Western goddesses in contexts of cultural exchange and the religious practices directed toward the Queen Mother of the West (Wang Yu and Tang Xiyang 2015).

5 The three kingdoms period to Qing dynasty

There are two discoveries among the *Top 10 Archaeological Discoveries* in 2015 dating to the Three Kingdoms period to Qing Dynasty. In addition, other archaeological discoveries belonging to this period were reported along with related papers.

From June to December 2015, the Inner Mongolian Institute of Cultural Relics and Archaeology conducted salvage excavations of Liao 辽 Dynasty tombs at Xiaowangligou 小王力沟 in Tiegongpaozi 铁公袍子 Village, Caimushan 蔡木

山 Town, Duolun 多伦 County, Xilingol 锡林郭勒 League. They discovered two large tombs of the Liao Dynasty. Tomb No. 1 is composed of an entrance passage, tomb doorway, vaulted passages leading to the dooryard, and vaulted corridors and chambers, with a total length of 25.6 m. Tomb No. 2 is composed of an entrance passage, a vestibule, a door imitating a wooden structure, vaulted passages leading to the dooryard, vaulted corridors, and the main chamber, with a total length of more than 40 m. Although the two tombs had been robbed, there were still a large number of precious artifacts unearthed. According to the tomb structure and the funerary objects, the two large tombs may belong to the same family and date to the Liao Dynasty. Through the unearthed epitaphs, we can know that the occupant of Tomb No. 2 was a noble consort of Emperor Shengzong 圣宗 of the Liao Dynasty. This is the first discovery of noble consort's tomb of the Liao Dynasty. As the most prominent family of the consort clans, there were a total of four queens in her family during the Liao Dynasty. Although an epitaph table was not found in Tomb No. 1 and the occupant is unknown, considering the large scale of the tomb, the high-level funerary objects, and other information, it can be inferred to be the tomb of a noble member of a prominent family in the Liao Dynasty or even of an important member of the same family as the noble consort. The excavation of the these two tombs is of great significance, and it will promote research on the clan lineages of the Liao Dynasty, and even fill some blanks in research on the history of the Liao Dynasty (Gai Zhiyong 2015).

The Dandong No. 1 shipwreck is located in the sea over 50 km southwest of Dandong 丹东 City, Liaoning Province. From 2013 to 2015, an underwater archaeological team consisting of members from the National Center of Underwater Cultural Heritage and the Liaoning Provincial Institute of Cultural Relics and Archaeology carried out investigations and excavations of underwater cultural heritage sites around the area: this is an important achievement of underwater archaeology in China in recent years. There were 60 type of artifacts discovered, including 150 items involving ship components, weapons, personal items, etc. According to historical documents, local oral histories, and archaeological discoveries of the ship structure, including a dome deck and square porthole, and standard tableware with the inscription “Zhiyuan 致远,” scholars agreed that Dandong No. 1 shipwreck is the Zhiyuan warship of the Beiyang 北洋 fleet. These discoveries provide very precious material data for the study of Chinese modern history and the sea battle history of the Jiawu Sino-Japanese War of 1894–1895 (Zhou Chunshui 2015).

Previous archaeological discoveries published in 2015 include the following:

In October 2008, the Luoyang Municipal Archaeological Team excavated a tomb of the Western Jin Dynasty on the south side of Guanlin 关林 Road to the west of Changxing

长兴 Street in Luolong 洛龙 District, Luoyang City. This tomb was a brick double-chamber tomb with vaulted ceilings consisting of a passage, a tunnel with a sealed-door wall, antechamber, corridor, and rear chamber. The passage was in the shape of a vertical shaft with ramp bottom in rectangular plan; the tunnel and corridor were in a rectangular plan; the antechamber was roughly in a square plan; and the rear chamber was in a rectangular plan. The grave goods, including pottery, coins, etc., were mainly unearthed in the tunnel and the antechamber. The tomb structure and the grave goods show that the date of this tomb was the middle to late Western Jin Dynasty (Guanlin Road 2015).

From October 2009 to February 2010, the Hebei Archaeological Team, IA, CASS, conducted coring tests and excavations at the cemetery of the Li family of Zhao 赵 Commandery of the Northern Dynasties period at Xigao 西高 Township, Zhanhuang 赞皇 County. The cemetery is located on the course of the middle route of the South-North Water Transfer Project. Among the excavated tombs, M52 was a brick single-chamber tomb with a long ramp passage, a tunnel corridor, an entrance-sealing wall, and chamber. The grave goods unearthed from this tomb were mainly pottery, porcelains, bronzes, and stone epitaphs. According to the text of the epitaphs, the occupants of this tomb were Li Zhongyin 李仲胤, who was a native of Zhao Commandery, and his wife, whose name was Xing Senglan 邢僧兰, from Hejian 河间 Commandery. This tomb with clear provenance and exact date provides important materials for research on the burial archaeology and history of the Northern Wei Dynasty (Xigao 2015a). Tomb M4 was a single-chamber earthen cave tomb consisting of a long ramp passage, tunnel, and chamber, from which pottery and porcelain wares, bronzes, and other grave goods were unearthed. The epitaph unearthed from this tomb shows that its occupants were Li Yi 李翼 from Zhao Commandery of the Northern Wei Dynasty and his wife, whose name was Cui Huihua 崔徽华, from Boling 博陵 Commandery. This tomb has exact attribution, clear date, and a complete grave goods assemblage, so it can be seen as an important chronological calibrating rod (Xigao 2015b).

From June through October 2006, the Department of Archaeology of Sichuan University and other institutions excavated a tomb dating to the Sui-Tang period belonging to a couple, with the male named Qifu Linghe 乞扶令和. The tomb was located to the north of Da Sima 大司马 Village in Weihui 卫辉 City, Henan. It was a large-sized earthen cave tomb with a long ramp passage, recesses on the walls, tunnels, ventilating shafts, entrance-sealing wall, stone door, corridor, and tomb chamber. Murals were painted on the walls of the corridor and the tomb chamber. The tomb had been severely looted and damaged, but rather rich grave goods were still preserved: the unearthed pottery figurines and other artifacts bear features of the early Sui Dynasty. The inscription of the unearthed epitaph shows that Qifu Linghe, one of the occupants of this

tomb, died in the sixth year of the Daye 大业 Era of the Sui Dynasty (AD 610) and was buried together with his wife in the first year of the Zhenguan 贞观 Era of the Tang Dynasty (AD 627) (Da Sima 2015).

From January through March 2012, the Luoyang Municipal Institute of Cultural Relics and Archaeology excavated a kiln group of the Tang and Song 宋 Dynasties in the ward zone on the north bank of the Luo River within the outer city of the Sui-Tang Luoyang City Site. The excavation recovered 12 kilns, which were mostly in Ω -shaped plans, consisting of an operating pit, entrance, firebox, stacking floor, and flue system. The superimposition and intrusion relationships of the stratigraphy and the features as well as the typological characteristics of the unearthed artifacts show that these kilns can be divided into early and late phases. Referring to the historic literature, the kilns of the early phase operated from the beginning of the Tang Dynasty and continued in use sometime up to the nineteenth year of the Kaiyuan Era (AD 731). The kilns of the late phase were operated in the late Tang through the early Northern Song Dynasties. This kiln site would have belonged to the large-scale state-run kilns in Sui-Tang Luoyang City (Xinjiekou 2015).

The site of the Grand Bao'en Temple 大报恩寺 is located in the ancient Changganli 长干里 outside the middle south gate of Nanjing City. From February 2007 to the end of 2010, the Nanjing Municipal Institute of Archaeology conducted excavations in the north zone of the site, during which 3.6 ha of remains were uncovered, and the main architecture and general layout of the north zone were made clear. During the excavation, a pagoda foundation located on the central axis of the north zone of the site was revealed. In the center of the pagoda foundation, an underground palace with a circular mouth was found. Later, two ash pits were found in the pagoda foundation, and 46 column base pits were found along its periphery. From the underground palace, a "Buddha's parietal bone" *sarira*, jewelry-adorned silver Asoka stupa, and other Buddhist relics were unearthed. According to the text of *The Inscription of the Stone Crypt of the Real Buddha Remains Pagoda at Changan Temple in Jinling* unearthed from this underground palace, this underground palace was that of the Zhenshen Ta 真身塔 (Real Buddha Remains Pagoda) built in the fourth year of the Dazhongxiangfu 大中祥符 Era (AD 1011) of the Northern Song Dynasty. The pagoda foundation and underground palace of the Grand Bao'en Temple are new important discoveries in Buddhist archaeology in China, and the large amount of Buddhist cultural relics unearthed from them are very valuable, as they provide important physical materials for research in all of the related disciplines (Grand Bao'en Temple 2015).

From May through July 2012, part of the shipwreck Xiaobaijiao 小白礁 No. 1 above the sealed in sea area of Xiangshan 象山 County, Zhejiang Province, was excavated. The superstructure, side boards, and other parts of the ship

higher than the seabed were missing, and only a small part of the keel and bottom boards remained, at the south end of the exposed seabed. The remaining length of the shipwreck was about 20.35 m and the width, 7.85 m, and the whole ship had been broken into two halves situated east and west of each other. The recovered ship parts include the keel, ribs, bottom planks, bulkheads, bottom boards, mast bases, draining hole, and square posts, etc. 118 artifacts were recovered, most of which were porcelain wares, plus some pottery, metal objects, stone boards, etc. The date of the sinking of this ship would be in the Daoguang 道光 Era (1821–1850) of the Qing Dynasty (Xiaobaijiao 2015).

Xu Longguo (2015) discusses the evolution process of the forms of the gateways of the capital city gates from the Bronze Age Three Dynasties period (Xia, Shang, and Zhou) to the Sui and Tang Dynasties. His paper consists of four parts: first, a summary of all of the discoveries of gates of capital cities from the pre-Qin period through the Sui and Tang Dynasties, elucidating the development procedure from single-way gates to multi-way gates; second, examining the reasons for the emergence of the multi-way city gates and how the gates relate to the design of the capital cities; third, exploring the political and ritual functions of the multi-way city gates; and fourth, a conclusion with the main viewpoints of the entire paper. These include: 1. The gateways of the capital city gates of ancient China can be divided into early and late phases, with the divide at the Western Han Dynasty: the early phase gates are mainly single-way gates and late phase gates are mostly multi-way gates (and primarily three-way gates). 2. The three-way city gates had nothing to do with the number of steps of the palace: the strict, three-flight-step system was not established in the Three Dynasties period, and discussions related to the three-flight-step system in the extant historic literature might be resultant from doctoring to the ancient canons and scriptures by Confucian scholars during the Han Dynasty. 3. The emergence of the multi-way gates and the designing of the "three gates on each side (of the capital city)" provided conditions for forming the central axis layout for the ancient capital cities and for establishing the design principle of *jian zhong li ji* 建中立极 (building the main hall of the palace in the center of the capital and setting a central axis pointing to the pole star) for the palaces (Xu Longguo 2015).

Qi Dongfang (2015) points out that the "Jin System" of funeral systems included specific ideas, customs, rites and ceremonies, and regulations. The "funeral ideas" were the understanding and knowledge about death; the "funeral customs" were the widely-accepted ways and procedures of entombing and mourning the dead; and "funeral rites and ceremonies" were the rational expressions and systematic action patterns of the funeral ideas and customs. The "funeral regulations" were the mandatory rules and systems that must be followed in the funerals. They had cause-result relationships and were also usually seen as a whole. The so-called

“systematic evolution” resulted in the dynamic formation of all four. The Western Jin Dynasty inherited and intensified the “decree for austere burial” of the Wei Kingdom in the Three Kingdoms period, requiring burials “not to be mounded and monumentalized,” which is archaeologically reflected in the sacrificial altar, pottery seat, pottery tray and armrest, epitaph appearing in the tomb chambers, and the new grave good assemblage of pottery figurines and oxcarts found in tombs. All of these show that new funeral customs were formed when the new funeral ideas were accepted by the society. The argument on the funeral rites and ceremonies in the Western Jin Dynasty simplified the funeral procedure, while interference by political powers promoted the new funeral procedure as a legal obligation not to be violated. The funeral reforms of the Three Kingdoms period through the Jin Dynasty started by the “decree for austere burial” introduced new funeral ideas and customs; having received ritual supports, the new funeral customs also had systematic and political guarantees. Compared with the burials under the “Han System,” the reformed burials feature three key changes: first, the shrine or memorial hall, stone tablet, stone pillars, and stone sculptures on the ground were omitted; second, the multi-chamber burial structures resembling the front hall, rear rooms, kitchen, granary, and so on, declined, and the single-chamber structure decorated with simulated windows and lamp recesses became the most popular burial type, which was still built as a residence for the afterlife; third, in the grave goods assemblages, models reflecting rural manor life declined and procession lines consisting of oxcarts and figurines became the core of the assemblage. The evolution of the burial system in ancient China had a new appearance from this period onward (Qi Dongfang 2015).

Huo Wei (2015) also discusses the mausoleum system of China and the development and evolution from the “Han System” to the “Jin System” in the Six Dynasties period. On the ground and in their underground structures, high-ranking burials of the Six Dynasties period all had sculptures or figures of mythical animals with guardian or quelling meanings, the motifs and styles of which had not only components inherited from burials of the Han Dynasty, but also contained newly-emerged cultural elements, especially the auspicious beast system represented by lions. This new auspicious beast system is related to the “Han System” of the past but also features clear differences. These changes reflect the symbolic features of the formation of the “Jin System” in another aspect and had far-reaching influence on the burial systems of the Tang and Song Dynasties (Huo Wei 2015).

Liu Daiyun (2015) argues that Sui burials in the Guanzhong region are distributed primarily in the eastern, southern, and western suburbs of Daxing 大兴 City, Shaanxi Province. Specifically, the mural tomb at Shuicun 税村 in Tongguan 潼关 represents a cemetery area of the imperial family. Other high-ranking elite tombs are concentrated at

Bailuyuan 白鹿原 and Tongrenyuan 铜人原. Medium and low ranking officials were buried at Fengqiyuan 凤栖原 and Gaoyangyuan 高阳原 in the southern suburbs as well as at Hongduyuan 洪渎原 in Xianyang. In addition, commoner tombs are found scattered on various small plateaus nearby their original settlements. Among them, the tombs in Fengxiang 凤翔 represent the most typical commoner cemetery. Imperial servants were buried at Sanmingcun in the western suburbs, or the so-called Gongrenxie 宫人斜 in the literature (Liu Daiyun 2015).

Based on the periodization and distribution of the tombs of the Mongol period and the Yuan Dynasty and referring to the textual materials from tombstones and epitaphs and the different funeral customs, Dong Xinlin (2015) classifies these tombs into the tombs of the Mongol people, the tombs of “Mongolized” people, the tombs of the *se mu ren* 目人 (miscellaneous aliens), and tombs of Han people. He also preliminarily summarizes the features of the funeral customs shown in the tombs of the Mongol people, providing a reference for identifying tombs without inscriptions from the Mongol Period and the Yuan Dynasty (Dong Xinlin 2015).

Acknowledgements I am deeply indebted to three graduate students, Yang Lin (杨琳), Wei Kai (魏凯), and Wang Jianfeng (王建峰), for their collection and translation of some of the archaeological data during the preparation of this paper.

Open Access This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

References

- Chen Shuxiang 陈树祥. 2015. “Gu dai kuang ye gong ren de zu ji—Hubei Daye Tonglúshan Sifangtang yi zhi mu zang qu 古代矿冶工人的足迹——湖北大冶铜绿山四方塘遗址墓葬区 (The Sifangtang cemetery of the Tonglúshan site in Daye City, Hubei Province, reveals the footprints of ancient miners).” *Zhongguo wen wu bao* 中国文物报 2016-05-20: 6.
- Chen Xiaoshan 陈小三. 2015. “Pingdingshan Ying guo mu di xin jian tong he yu Wu Yue di qu xi Zhou tong qi duan dai 平顶山应国墓地新见铜盃与吴越地区西周铜器断代 (the bronze *he*-pitcher newly seen in the cemetery of the Ying state in Pingdingshan City and the chronology of the western Zhou bronzes of the Wu-Yue region).” *Kao gu* 考古 2015.5: 93–102.
- Chen Youcheng 陈宥成 and Qu Tongli 曲彤丽. 2015. “‘Lewalouwa’ ji shu yuan liu guan kui ‘勒瓦娄哇技术’源流管窥 (on the origin and development of ‘Levallois technology’).” *Kao gu* 2015.2: 71–78.
- Da Sima. 2015. Sichuan da xue kao gu xue xi 四川大学考古学系 and Henan sheng wen wu ju nan shui bei diao wen wu baohu ban gong shi 河南省文物局南水北调文物保护办公室 (2015). “Henan Weihui shi Dasima cun Sui-Tang Qifu Linghe fu fu mu 河南卫辉市大司马村隋唐乞扶令和夫妇墓 (The tomb of the couple Qifu Linghe and his wife of

- the Sui and Tang Dynasties at Da Sima Village in Weihui City, Henan)." *Kao gu* 2015.2: 32–70.
- Dong Xinlin. 2015. "Bei fang di qu Meng yuan mu zang chu tan 北方地区蒙元墓葬初探 (a preliminary research on the tombs of the Mongol period and the yuan dynasty in northern China)." *Kao gu* 2015.9: 114–120.
- Dongshancun 2015a: Nanjing Museum 南京博物院, Zhangjiagang Municipal Bureau for Cultural Heritage Management 张家港市文物管理委员会, and Zhangjiagang Museum 张家港博物馆. 2015. "Zhangjiagang Dongshancun xin shi qi shi dai yi zhi fa jue bao Gao 张家港东山村新石器时代遗址发掘报告 (the excavation of the Neolithic Dongshancun site in Zhangjiagang City)." *Kao gu xue bao* 考古学报 2015.1: 55–100.
- Dongshancun 2015b: Nanjing Museum 南京博物院, Zhangjiagang Municipal Bureau for Cultural Heritage Management 张家港市文物管理委员会, and Zhangjiagang Museum 张家港博物馆. 2015. "Jiangsu Zhangjiagang shi Dongshancun yi zhi Songze wen hua mu zang M90 fa jue jian bao 江苏张家港市东山村遗址崧泽文化墓葬M90发掘简报 (the excavation of tomb M90 of the Songze culture at the Dongshancun site in Zhangjiagang City, Jiangsu)." *Kao gu* 2015.3: 3–19.
- Erlitou 2015a: Erlitou Archaeological Team, IA, CASS 中国社会科学院考古研究所二里头工作队. 2015. "Henan Yanshi shi Erlitou yi zhi qiang yuan he dao lu 2012–2013 nian fa jue jian bao 河南偃师市二里头遗址墙垣和道路2012—2013年发掘简报 (the excavation of the walls and roads of the Erlitou site in Yanshi City, Henan in 2012–2013)." *Kao gu* 2015.1: 40–57.
- Erlitou 2015b: Erlitou Archaeological Team, IA, CASS 中国社会科学院考古研究所二里头工作队. 2015. "Henan Yanshi shi Erlitou yi zhi gong dian qu 1 Hao ju xing keng de kan tan yu fa jue 河南偃师市二里头遗址宫殿区1号巨型坑的勘探与发掘 (the detection and excavation of the huge pit no. 1 at the palace zone of the Erlitou site in Yanshi City, Henan)." *Kao gu* 2015.12: 18–37.
- Fengjiazhong 2015a: Jingzhou Museum 荆州博物馆. 2015. "Hubei Jingzhou Balingshan Fengjiazhong chu mu 2011–2012 nian fa jue jian bao 湖北荆州八岭山冯家冢楚墓2011–2012年发掘简报 (the excavation of the Fengjiazhong cemetery of the Chu state at Balingshan in Jingzhou, Hubei, in 2011–2012)." *Wen wu* 文物 2015.2: 9–22.
- Fengjiazhong 2015b: Jingzhou Museum. 2015. "Hubei Jingzhou Balingshan Fengjiazhong chu mu ji si keng 2013 nian fa jue jian bao 湖北荆州八岭山冯家冢楚墓祭祀坑2013年发掘简报 (the excavation of the sacrificial pits of the Fengjiazhong cemetery of the Chu state at Balingshan in Jingzhou, Hubei, in 2013)." *Wen wu* 2015.2: 28–32.
- Fu Lin 付琳 and Wang Lixin 王立新. 2015. "Xiajiadian xia ceng wen hua xiao wang hou de liao xi 夏家店下层文化消亡后的辽西 (western Liaoning after the vanishing of lower Xiajiadian culture)." *Kao gu* 2015.8: 89–102.
- Fu Xianguo 傅宪国. 2015. "Gou jian Hainan wan zheng de shi qian wen hua shi—Hainan dong nan bu yan hai di qu xin shi qi shi dai yi cun 构建海南完整的史前文化史——海南东南部沿海地区新石器时代遗址 (The Neolithic Age sites in the southeastern coastal area of Hainan constructed the complete prehistoric cultures in Hainan)." *Zhongguo wen wu bao* 2016–05–20: 6.
- Fu Zhongyang 付仲杨. 2015. "Fenghao yi zhi de zhi gu yi cun yu zhi gu shou gong ye 丰镐遗址的制骨遗存与制骨手工业 (the bone workshop remains and bone industry in the Fenghao site)." *Kao gu* 2015.9: 92–100.
- Gai Zhiyong 盖志勇. 2015. "Da liao gui fei de chang mian di—Neimenggu Duolun Liao dai gui fei jia zu mu zang 大辽贵族的长眠地——内蒙古多伦辽代贵族家族墓葬 (The noble consort's family cemetery of the Liao Dynasty in Duolun County, Inner Mongolia)." *Zhongguo wen wu bao* 2016–05–20: 6.
- Grand Bao'en Temple 2015: Nanjing Municipal Institute of Archaeology 南京市考古研究所. 2015. "Nanjing Da Bao'en si yi zhi ta ji yu di gong fa jue jian bao 南京大报恩寺遗址塔基与地宫发掘简报 (the excavation of the pagoda foundation and underground palace of the grand Bao'en temple in Nanjing)." *Wen wu* 2015.5: 4–52.
- Guanlin Road. 2015: Luoyang Municipal Institute of Cultural Relics and Archaeology 洛阳市文物考古研究院. 2015. "Henan Luoyang shi Guanlin lu nan Xijin mu 河南洛阳市关林路西晋墓 (the western Jin tomb on the south side of the Guanlin road, Luoyang City, Henan)." *Kao gu* 2015.9: 25–40.
- Guo Xiaorong 郭晓蓉 (2015). "2015 nian du quan guo shi da kao gu xin fa xian jie xiao 2015年度全国十大考古新发现揭晓 (The top ten new archaeological discoveries for 2015 announced)." *Zhongguo wen wu bao* 2016–05–17: 1.
- Han Jianye 韩建业. 2015. "Jian lun Zhongguo xin shi qi shi dai tao ding de fa zhan yan bian 简论中国新石器时代陶鼎的发展演变 (a preliminary discussion on the evolution of the pottery ding-tripods during the Neolithic age in China)." *Kao gu* 2015.1: 69–79.
- Huo Wei 霍巍. 2015. "Liu chao ling mu zhuan shi zhong rui shou de Shan bian yu jin zhi de xing cheng 六朝陵墓装饰中瑞兽的嬗变与晋制的形成 (the evolution of the auspicious beasts in the burial decoration of the six dynasties period and the formation of the 'Jin system')." *Kao gu* 2015.2: 103–113.
- Jing Zhongwei 井中伟 and He Feifei 和菲菲. 2015. "Anyang Wanggudao cun zhou dai gui zu mu si ti 安阳王古道村周代贵族墓四题 (four issues related to the Zhou elite burials at the Wanggudao village in Anyang)." *Kao gu yu wen wu* 考古与文物 2015.5: 44–49.
- Kim Byung-joon 金秉骏. 2015. "Han dai ju luo fen bu de bian hua—Yi mu zang he xian cheng ju li de fen xi wei xian suo 汉代聚落分布的变化——以墓葬和县城距离的分析为线索 (the change of the distribution of the settlements in the Han dynasty: Based on an analysis of the distances of the burials from the county seats)." *Kao gu xue bao* 2015.1: 36–54.
- Li Feng 李峰. 2015. "Xi Zhou qing tong qi ming wen zhi zuo fang fa shi yi 西周青铜器铭文制作方法释疑 (solving puzzles about the method of casting inscriptions on western Zhou bronzes)." *Kao gu* 2015.9: 78–91.
- Li Xinwei 李新伟. 2015. "Zhongguo shi qian she hui shang ceng yuan yu li jiao liu wang de xing cheng 中国史前社会上层远距离交流网的形成 (the formation of long-distance exchange networks of the upper-class of prehistoric society in China)." *Wen wu* 2015.4: 51–58.
- Li Yali 李亚利 and Teng Mingyu 滕铭予. 2015. "Han hua xiang zhong de ting xie jian zhu yan jiu 汉画像中的亭榭建筑研究 (research on pavilion architecture in Han pictorial images)." *Kao gu yu wen wu* 2015.2: 82–90.
- Liangzhu 2015a: Zhejiang Provincial Institute of Cultural Relics and Archaeology 浙江省文物考古研究所. 2015. "Hangzhou shi Liangzhu gu cheng Wai wei shui li xi tong de kao gu diao cha 杭州市良渚古城外围水利系统的考古调查 (the survey of the water control engineering on the periphery of the Liangzhu Ancient City in Hangzhou)." *Kao gu* 2015.1: 3–13.
- Liangzhu 2015b: Zhejiang Provincial Institute of Cultural Relics and Archaeology 浙江省文物考古研究所. 2015. "Hangzhou shi Liangzhu gu cheng Wai guo de tan cha yu Meirendi he Biandanshan de fa jue 杭州市良渚古城外部的探查与美人地和扁担山的发掘 (the detection of the outer city of the Liangzhu Ancient City and the excavations of the Meirendi and Biandanshan sites in Hangzhou)." *Kao gu* 2015.1: 14–29.
- Lin Liugen 林留根. 2015. "Wen ming kuo zhang de jian zheng—Jiangsu Xinghua Dongtai Jiangzhuang yi zhi 文明扩张的见证——江苏兴化、东台蒋庄遗址 (The Jiangzhuang site at the border of Xinghua and Dongtai counties, Jiangsu Province: testimony to civilization's expansion)." *Zhongguo wen wu bao* 2016–05–20: 6.
- Lin Meicun 林梅村. 2015. "Saiyima-Tuerbinnuo wen hua yu shi qian si chou zhi lu 塞伊玛—图尔宾诺文化与史前丝绸之路 (the Seima-Turbino culture and the prehistoric silk road)." *Wen wu* 2015.10: 49–63.
- Liu Daiyun 刘aisyun. 2015. "Guanzhong di qu sui dai mu di fen buyan jiu 关中地区隋代墓地分布研究 (on the distribution of the cemeteries of

- the sui dynasty in the Guanzhong region)." *Kao gu yu wen wu* 2015.5: 74–79.
- Liu Jianhui 刘建辉. 2015. "Yuan gu ren lei sheng huo de wan zheng tu jing—Yunnan Jiangchuan Gantangqing jiu shi qi yi zhi 远古人类生活的完整图景—云南江川甘棠箐旧石器遗址 (The Gantangqing Paleolithic sites in Jiangchuan County, Yunnan Province, reveal the complete life prospects of ancient humans)." *Zhongguo wen wu bao* 2016–05–20: 6.
- Liu Rui 刘瑞, Gao Jiangtao 高江涛, and Kong Deming 孔德铭. 2015. "Zhongguo suo jian Saiyima-Tuerbinnuo shi dao gou tong Mao de he jin cheng fen 中国所见塞伊玛—图尔宾诺式倒钩铜矛的合金成分 (the alloy components of the Seima-Turbino style socketed bronze spearhead with a side hook found in China)." *Wen wu* 2015.10: 77–85.
- Liu Xiang 刘翔. 2015. "Qinghai Datong xian Saiyima-Tuerbinnuo shi dao gou tong Mao kao cha yu xiang guan yan jiu 青海大通县塞伊玛—图尔宾诺式倒钩铜矛考察与相关研究 (the investigation and correlational research on the Seima-Turbino stylistic socketed bronze spearhead with a side hook unearthed in Datong County, Qinghai)." *Wen wu* 2015.10: 64–69.
- Liu Yang 刘扬, Hou Yamei 侯亚梅, and Yang Zemeng 杨泽蒙. 2015. "E'erdusi shi Wulanmulun yi zhi shi he Bo pian ji shu de jie duan lei xing xue yan jiu 鄂尔多斯市乌兰木伦遗址石核剥片技术的阶段类型学研究 (the stage typological study on the core reduction technique of the Wulanmulun site in Ordos City)." *Kaogu* 2015.6: 68–79.
- Miaopu Cemetery 2015a: Liaoning Provincial Institute of Cultural Relics and Archaeology 辽宁省文物考古研究所. 2015. "Liaoning Liaoyang shi Miaopu mu di Han dai tu keng mu 辽宁辽阳市苗圃墓地汉代土坑墓 (the earthen shaft pit tombs of the Han dynasty at Miaopu cemetery in Liaoyang, Liaoning)." *Kao gu yu wen wu* 2015.4: 53–66.
- Miaopu Cemetery 2015b: Research Center for Chinese Frontier Archaeology, Jilin University 吉林大学边疆考古研究中心 and Liaoning Provincial Institute of Cultural Relics and Archaeology 辽宁省文物考古研究所. 2015. "Liaoning Liaoyang Miaopu Han Wei shi shi mu 2008 nian fa jue bao Gao 辽宁辽阳苗圃汉魏石室墓2008年发掘报告 (report on the 2008 excavations in the Miaopu cemetery, Liaoyang, Liaoning, of stone tombs of the Han dynasty to the three kingdoms period)." *Kao gu xue bao* 2015.4: 505–536.
- Qi Dongfang 齐东方. 2015. "Zhongguo gu dai sang zang zhong de Jin zhi 中国古代丧葬中的晋制 (a study on the Jin system of funeral systems in ancient China)." *Kao gu xue bao* 2015.03: 345–366.
- Qian Guoxiang 钱国祥. 2015. "Zijincheng shi zu—Henan Luoyang Han Wei Luoyangcheng Taijidian yi zhi 紫禁城始祖——河南洛阳汉魏洛阳城太极殿遗址 (The earliest ancestor of the Forbidden Palace in Beijing was probably the Taiji Hall site of Luoyang City during the Han and Wei Dynasties, Henan Province)." *Zhongguo wen wu bao* 2016–05–20: 6.
- Qin Duke Mausoleums 2015a: Shaanxi Provincial Institute of Archaeology, et al. 陕西省考古研究院等. 2015. "Yongcheng yi liu Hao qin gong ling yuan di san ci kan tan jian bao 雍城一、六号秦公陵园第三次勘探简报 (preliminary report on the third coring investigation of the no. 1 and no. 6 Qin Duke mausoleums)." *Kao gu yu wen wu* 2015.4: 9–14.
- Qin Duke Mausoleums 2015b: Shaanxi Provincial Institute of Archaeology, et al. 陕西省考古研究院等. 2015. "Yongcheng liu Hao Qin gong ling yuan zhao gou xi nan ce zhong xiao xing mu zang yu che ma keng fa jue jian bao 雍城六号秦公陵园兆沟西南侧中小型墓葬与车马坑发掘简报 (preliminary report on the excavation of medium and small tombs and chariot pits to the southwest of the moat of the no. 6 mausoleum of the Qin Duke in Yongcheng)." *Kao gu yu wen wu* 2015.4: 15–20.
- Qin Duke Mausoleums 2015c: Shaanxi Provincial Institute of Archaeology, et al. 陕西省考古研究院等. 2015. "Yongcheng shi si Hao qin gong ling yuan zuan tan jian bao 雍城十四号秦公陵园钻探简报 (preliminary report on the augering results of the no. 14 Qin Duke mausoleum in Yongcheng)." *Kao gu yu wen wu* 2015.4: 3–8.
- Shan Yueying 单月英. 2015. "Dong Zhou Qin dai Zhongguo bei fang di qu kao gu xue wen hua ge ju—Jian lun Rong Di Hu yu Huaxia zhi jian de hu dong 东周秦代中国北方地区考古学文化格局——兼论戎、狄、胡与华夏之间的互动 (the pattern of the archaeological cultures in northern China during the eastern Zhou period to the Qin dynasty—Also on the interactions among the Rong, Di, and Hu ethnic groups and the Central Plains)." *Kao gu xue bao* 2015.3: 303–344.
- Shao Huiqiu 邵会秋 and Yang Jianhua 杨建华. 2015. "Cong Xiajiadian shang ceng wen hua qing tong qi kan cao yuan jin shu zhi lu 从夏家店上层文化青铜器看草原金属之路 (the steppe metal route seen from the bronzes of the upper Xiajiadian culture)." *Kao gu* 2015.10: 85–99.
- Shijiahe 2015: Shaanxi Provincial Institute of Archaeology, et al. 陕西省考古研究院等. 2015. "Shanxi Huangling xian Shijiahe mu difa jue jian bao 陕西黄陵县史家河墓地发掘简报 (preliminary report on the excavation of the Shijiahe cemetery in Huangling County, Shaanxi)." *Kao gu yu wen wu* 2015.3: 3–13.
- Song Rong 宋蓉. 2015. "Nanyangdi qu Han dai mu zang yan jiu—Jian lun Nanyang di qu Han wenhua de xing cheng 南阳地区汉代墓葬研究——兼论南阳地区汉文化的形成 (the study of the burials of the Han dynasty in the Nanyang area—Also on the formation of the Han culture in the Nanyang area)." *Kao gu xue bao* 2015.2: 157–186.
- Sun Zhouyong 孙周勇, Sun Zhanwei 孙战伟, and Shao Jing 邵晶. 2015. "Huangling Shijiahe Zhan Guo mu di xiang guan wen ti tan tao 黄陵史家河战国墓地相关问题探讨 (on the related issues of the Shijiahe warring states cemetery in Huangling)." *Kao gu yu wen wu* 2015.3: 60–66.
- Tang Jinqiong 唐锦琼. 2015. "Lun Yinxu tong qi mu zhong tao qi de shi yong fang shi 论殷墟铜器墓中陶器的使用方式 (on the methods of use of pottery in the burials yielding bronzes in the Yinxu site)." *Kao gu* 2015.4: 88–95.
- Taojiazhai 2015: Qinghai Provincial Institute of Cultural Relics and Archaeology 青海省文物考古研究所. 2015. "Qinghai Xining Taojiazhai Han mu fa jue jian bao 青海西宁陶家寨汉墓发掘简报 (the excavation of the tombs of the Han dynasty at Taojiazhai village in Xining, Qinghai)." *Wen wu* 2015.9: 39–48.
- Taosi 2015: Shanxi Archaeological Team, Institute of Archaeology, CASS 中国社会科学院考古研究所山西队 and Shanxi Provincial Institute of Archaeology 山西省考古研究所. 2015. "Shanxi Xiangfen xian Taosi yi zhi III qu da xing hang tu ji zhi fa jue jian bao 山西襄汾县陶寺遗址III区大型夯土基址发掘简报 (the excavation of the large-sized rammed-earth foundation in zone III of the Taosi site in Xiangfen County, Shanxi)." *Kao gu* 2015.1: 30–39.
- Terracotta Army Pits of Emperor Qin Shihuang's Mausoleum 2015: The Archaeological Team of the Terracotta Army Pits of Emperor Qin Shihuang's Mausoleum Site Museum 秦始皇帝陵博物院兵马俑坑考古队. 2015. "Qin Shihuang di ling yi hao bing ma yong pei zang keng 2009–2011 nian fa jue jian bao 秦始皇帝陵一号兵马俑陪葬坑2009–2011年发掘简报 (the excavation of the terracotta Army pits no. 1 of emperor Qin Shihuang's mausoleum in 2009–2011)." *Wen wu* 2015.9: 4–38.
- Wang Lixin 王立新 and Fu Lin 付琳. 2015. "Lun Keshenketeng qi Xiquegou tong kuang yi zhi ji xiang guan wen ti 论克什克腾旗喜鹊沟铜矿遗址及相关问题 (on the Xiquegou copper mine site in Hexingten banner and related issues)." *Kao gu* 2015.4: 79–87.
- Wang Ningyuan 王宁远. 2015. "5000 nian qian wang guo de wei da gong cheng —Zhejiang Yuhang Liangzhu gu cheng wai wei da xing shui li gong cheng de diao cha yu fa jue 5000年前王国的伟大工程——浙江余杭良渚古城外围大型水利工程的调查与发掘 (The investigation and excavation of the outside large-scale water conservancy system of the Liangzhu Ancient City in Yuhang County, Zhejiang Province reveals the great project of the kingdom 5,000 years ago)." *Zhongguo wen wu bao* 2016–05–20: 6.

- Wang Weilin 王炜林. 2015. "Miaodigou wen hua yu bi de qi yuan 庙底沟文化与璧的起源 (the Miaodigou culture and the origin of *bi* jades)." *Kao gu yu wen wu* 2015.6: 30–34.
- Wang Yu 王煜 and Tang Xiyang 唐熙阳. 2015. "Han dai xi Wang mu tu xiang yu xi fang nü shen xiang zhi guan xi ji qi bei jing 汉代西王母图像与西方女神像之关系及其背景 (the relationship between the queen mother of the west and western goddess and their historical background)." *Kao gu yu wen wu* 2015.5: 88–95.
- Wang Zhankui 王占奎 and Lei Xingshan 雷兴山. 2015. "Gu lao du yi de xin renshi —Shaanxi Baoji Zhou yuan yi zhi 古老都邑的新认识——陕西宝鸡周原遗址 (The Zhouyuan site in Baoji City, Shaanxi Province, reveals some new understandings about the ancient capital ruins)." *Zhongguo wen wu bao* 2016–05–20: 6.
- Wei qiao kao gu dui 渭桥考古队. 2015. "Xi'an shi Han Chang'an cheng bei Wei qiao yi zhi chu tu de gu chuan 西安市汉长安城北渭桥遗址出土的古船 (the ancient ship unearthed at the Wei bridge site to the north of Han Chang'an City in Xi'an)." *Kao gu* 2015.9: 3–6.
- Xiaobaijiao 2015: Ningbo Research Institute of Cultural Relics and Archaeology 宁波市文物考古研究所 and State Administration of Cultural Heritage Center for Underwater Cultural Heritage 国家文物局水下文化遗产保护中心. 2015. "Zhejiang Xiangshan xian 'Xiaobaijiao 1 Hao' Qing dai chen chuan 2012 nian fa jue jian bao 浙江象山县'小白礁1号'清代沉船2012年发掘简报 (the excavation of the shipwreck 'Xiaobaijiao no. 1' of the Qing dynasty at Xiangshan County, Zhejiang, in 2012)." *Kao gu* 2015.6: 54–67.
- Xipo 2015: First Henan Archaeological Team, Institute of Archaeology, CASS, et al. 中国社会科学院考古研究所河南一队. 2015. "Henan Lingbaoshi Xipo yi zhi Miaodigou lei xing liang zuo da xing fang zhi de fa jue 河南灵宝市西城遗址庙底沟类型两座大型房址的发掘 (the excavation of two large-sized house foundations of the Miaodigou culture period at the Xipo site in Lingbao City, Henan)." *Kao gu* 2015.5: 3–16.
- Xichengyi 2015a: Metallurgy History and Materials Research Institute of University of Science and Technology Beijing 北京科技大学冶金与材料史研究所 and Gansu Provincial Institute of Cultural Relics and Archaeology 甘肃省文物考古研究所. 2015. "Zhangye Xichengyi ye jin yi zhi diao cha bao gao 张掖西城驿冶金遗址调查报告 (report on the archaeological survey at the Xichengyi smelting site in Zhangye)." *Kao gu yu wen wu* 2015.2: 27–35.
- Xichengyi 2015b: Gansu Provincial Institute of Relics and Archaeology, et al. 甘肃省文物考古研究所等. 2015. "Gansu Zhangye shi Xichengyi yi zhi 2010 nian fa jue jian bao 甘肃张掖市西城驿遗址2010年发掘简报 (the excavation of the Xichengyi site in Zhangye City, Gansu, in 2010)." *Kao gu* 2015.10: 66–84.
- Xigao 2015a: Hebei Archaeological Team, Institute of Archaeology, CASS 中国社会科学院考古研究所河北工作队. 2015. "Hebei Zhanhuang xian Bei Wei li Zhongyinfu fu mu fa jue jian bao 河北赞皇县北魏李仲胤夫妇墓发掘简报 (the excavation of the tomb of li Zhongyin and his wife of the northern Wei dynasty in Zhanhuang County, Hebei)." *Kao gu* 2015.8: 75–88.
- Xigao 2015b: Hebei Archaeological Team, Institute of Archaeology, CASS 中国社会科学院考古研究所河北工作队. 2015. "Hebei Zhanhuang xian Bei Wei li Yi fu fu mu 河北赞皇县北魏李翼夫妇墓 (the tomb of li Yi and his wife of the northern Wei dynasty in Zhanhuang County, Hebei)." *Kao gu* 2015.12: 64–77.
- Xinjiekou 2015: Luoyang Municipal Institute of Cultural Relics and Archaeology 洛阳市文物考古研究院. 2015. "Henan Luoyang shi Xinjiekou tang-song Yao zhi de fa jue 河南洛阳市新街市唐宋窑址的发掘 (the excavations of the kiln sites of the tang and song dynasties at Xinjiekou in Luoyang City, Henan)." *Kao gu* 2015.6: 23–38.
- Xu Longguo 徐龙国. 2015. "Zhongguo gu dai du cheng men dao yan jiu 中国古代都城门道研究 (research on gateways of the ancient capital cities of China)." *Kao gu xue bao* 2015.4: 425–450.
- Xu Yongjie 徐永杰. 2015. "Zai shen Banpo wen hua he Miaodigou wen hua de nian dai guan xi-yi die ya da po he gong cun guan xi wei shi jiao 再探半坡文化和庙底沟文化的年代关系——以叠压打破和共存关系为视角 (a reexamination of the chronological relationship between the Banpo and Miaodigou cultures—with consideration of the superimposition, intrusion, and coexistence relationships)." *Kao gu* 2015.3: 74–89.
- Yang Jun 杨军. 2015. "Xi Han wang hou de di xia she hua—Jiangxi Nanchang Xi Han Haihun hou Liuhe mu 西汉王侯的地下奢华——江西南昌西汉海昏侯刘贺墓 (The tomb of Marquis Haihun Liuhe in Nanchang City, Jiangxi Province, reveals the underground luxuries of marquis in the Western Han Dynasty)." *Zhongguo wen wu bao* 2016–05–17: 1.
- Yang Wuzhan 杨武站 and Cao Long 曹龙. 2015. "Han baling di ling de mu zang xing zhi tan tao 汉霸陵帝陵的墓葬形制探讨 (on the structure of the baling mausoleum of the western Han dynasty)." *Kao gu* 2015.8: 113–120.
- Yanshi Shang City Site 2015: Second Henan Archaeological Team, IA, CASS 中国社会科学院考古研究所河南第二工作队. 2015. "Henan Yanshi Shang cheng gong cheng di san Hao gong dian jian zhu ji zhi fa jue jian bao 河南偃师商城宫城第三号宫殿建筑基址发掘简报 (the excavation of the hall no. 3 foundation in the palace city of the Yanshi Shang City in Henan)." *Kao gu* 2015.12: 38–51.
- Yinxu 2015a: Anyang Archaeological Team, IA, CASS 中国社会科学院考古研究所安阳工作队. 2015. "Henan Anyang shi Tiesan lu Yinxu wen hua shi qi zhi gu zuo fang yi zhi 河南安阳市铁三路殷墟文化时期制骨作坊遗址 (the bone workshop site of the Yinxu culture period at Tiesan road in Anyang City, Henan)." *Kao gu* 2015.8: 37–62.
- Yinxu 2015b: Anyang Archaeological Team, IA, CASS 中国社会科学院考古研究所安阳工作队. 2015. "Henan Anyang shi Dasikong cun dong di Shang dai yi cun 2012–2015 nian de fa jue 河南安阳市大司空村东地商代遗存2012–2015年的发掘 (the 2012–2015 excavations of the remains of the Shang dynasty at Dasikong Village locus east in Anyang, Henan)." *Kao gu* 2015.12: 52–63.
- Yuan Yanling 袁艳玲. 2015. "Chu shi ding de fen lei zu he ji qi li zhi han yi 楚式鼎的分类、组合及其礼制涵义 (the classification, assemblage and ritual connotation of the Chu-style *ding*-tripods)." *Kao gu* 2015.8: 103–112.
- Yuan Yanling 袁艳玲 and Zhang Wenjie 张闻捷. 2015. "Chu xi qing tong qi de fen qi yu nian dai 楚系青铜器的分期与年代 (the periodization and chronology of the bronzes of the Chu system)." *Kao gu xue bao* 2015.4: 475–504.
- Zhang Guoshuo 张国硕. 2015. "Shi xi Huanbei Shang cheng zhi cheng guo bu ju—Jian tan da cheng cheng yuan de jian zao 试析洹北商城之城郭布局——兼谈大城城垣的建造 (on the layout of the Huanbei Shang City: A discussion about the construction of the outer wall)." *Kao gu yu wen wu* 2015.4: 35–39.
- Zhang Liang 张亮 and Teng Mingyu 滕铭予. 2015. "Jin nan di qu dong Zhou shi qi tong qi mu zang yan jiu 晋南地区东周时期铜器墓葬研究 (a study of eastern Zhou tombs yielding bronzes in southern Shanxi)." *Kao gu* 2015.6: 87–100.
- Zhang Xingde 张星德. 2015. "Hougang qi Hongshan wen hua zai kao cha 后冈期红山文化再考察 (a reexamination of the Hongshan culture during the Hougang phase)." *Wen wu* 2015.5: 60–65.
- Zhou Chunshui 周春水. 2015. "Fa xian ying xiong jun jian—Liaoning 'Dandong yi hao' Qingdai chen chuan (Zhiyuan jian) shui xia kao gu diao cha 发现英雄军舰——辽宁'丹东一号'清代沉船(致远舰)水下考古调查 (Discovering the heroic warship: underwater investigation of the Dandong No. 1 Qing Dynasty shipwreck (the Zhiyuan warship)." *Zhongguo wen wu bao* 2016–05–20: 6.